

Work Order ID 85317

June-05-12 3:36:59 PM

85317

Page 1

Item ID: D407-667-205

Accept

Revision ID:

Item Name: Crosstube Aft

Start Date: 05/06/2012 Start Qty: 1.00 *1*

Required Date: 19/06/2012 Req'd Qty: 1.00 *1*

N900040100

Setup

Start

NS1

Stop

NS2

Reference:

Approvals: Process Plan: MLJ

Date: 12/06/05 Tooling:

Date:

Run

Start

NR1

QC:

Date:

SPC (Y/N):

Date:

Stop

NR2

Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
Draw Nbr	Revision Nbr								
100		0.00	DAS	16	17(02)01				
100	DOCUMENT CONTROL	0.00							
DC	Memo								
Document Control	Photocopy bluefile and create labels as per PPP D407-667-205	0.00							
110	Pick Kit	0.00							
110	Packaging	0.00							
Packaging	Memo	0.00							
120	Packaging	0.00							
120	BENDING MACHINE - CROSSTUBES	0.00							
CNC Bend 1	Memo	0.00							
CNC Delta 100 Bender	1-Bend tube as per Dwg D407-667-245 using CNC bender program 407 Aft and Folio 21	0.00							

B85317 D407-667-205 X

NCR: Yes / No

WORK ORDER NON-CONFORMANCE / UPDATE

DQA: _____ Date: _____

QA Closed: _____ Date: _____

Work Order: _____	DISPOSITION			AGAINST DEPARTMENT/PROCESS					
Part No. _____	Rework	<input type="checkbox"/>	Skid-tube	<input type="checkbox"/>	Crosstube	<input type="checkbox"/>	Prod. Eng. Coor.	<input type="checkbox"/>	Engineering
NCR No. _____	Scrap	<input type="checkbox"/>	Machining	<input type="checkbox"/>	Small Fab	<input type="checkbox"/>	Rec/Store/Packaging	<input type="checkbox"/>	Quality
	Use-as-is	<input type="checkbox"/>	Thermoforming	<input type="checkbox"/>	Finishing	<input type="checkbox"/>	Supplier	<input type="checkbox"/>	
	Work Order Update	<input type="checkbox"/>	Large Fab	<input type="checkbox"/>	Composite	<input type="checkbox"/>	Other	<input type="checkbox"/>	

Root Cause	Date	Step	Qty	Description of work order update or Non-conformance	Initial Chief Eng	Action Description	Sign & Date	Verification	QC Inspector
Doc/Data									
Equip/Tooling									
Operator									
Material									
Offset/Setup									
Other									
Process									
Supplier									
Training									
Unauthorized									

FAULT CATEGORY

Landing Gear	Hardware	General
<input type="checkbox"/> Bending Passes Below Min	<input type="checkbox"/> Breaking	<input type="checkbox"/> Maintenance
<input type="checkbox"/> Centre Not Concentric to O/S	<input type="checkbox"/> Missing	<input type="checkbox"/> Mislabeled
<input type="checkbox"/> Cracks	<input type="checkbox"/> Size/Length	<input type="checkbox"/> Off-Set
<input type="checkbox"/> Crushed/Crimp at Bending	<input type="checkbox"/> Spinning	<input type="checkbox"/> Orientation Misread
<input type="checkbox"/> Inspection Strip in Tube	<input type="checkbox"/> Threading	<input type="checkbox"/> Out of Calibration
<input type="checkbox"/> Other	<input type="checkbox"/> Wrong	<input type="checkbox"/> Out of Sequence
<input type="checkbox"/> Positioned Wrong		<input type="checkbox"/> Outside Dimensions
<input type="checkbox"/> Ripples on Inner Bend	Drill Holes	<input type="checkbox"/> Over/Under tolerance
<input type="checkbox"/> Torque Waves in Extrusion	<input type="checkbox"/> Misaligned	<input type="checkbox"/> Part Lost
<input type="checkbox"/> Turning Sequence	<input type="checkbox"/> Ovalized	<input type="checkbox"/> Part Moved
<input type="checkbox"/> Wave/Twist in Tube	<input type="checkbox"/> Over/Undersized	<input type="checkbox"/> Raw Material
	<input type="checkbox"/> Too Many	<input type="checkbox"/> Other

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Item ID: D407-667-205

Accept

Revision ID:

Item Name: Crosstube Aft

Start Date: 05/06/2012 **Start Qty:** 1.00 ***1***

Required Date: 19/06/2012 **Req'd Qty:** 1.00 ***1***

Reference:

Approvals:	Process Plan:	Date:	Tooling:	Date:	Run	Start	*NR1*
	QC:	Date:	SPC (Y/N):	Date:		Stop	*NR2*

Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
130 *130* QC Quality Control	QC15- Crosstube Dimensional Check Memo	0.00 0.00	17(04)17						

NCR: Yes / No

DQA: Date:

WORK ORDER NON-CONFORMANCE / UPDATE

QA Closed: _____ Date: _____

Date: _____

Work Order: _____			DISPOSITION		AGAINST DEPARTMENT/PROCESS																																																	
Part No. _____			Rework <input type="checkbox"/>	Skid-tube <input type="checkbox"/>	Crosstube <input type="checkbox"/>	Prod. Eng. Coor. <input type="checkbox"/>	Engineering Quality <input type="checkbox"/>																																															
NCR No. _____			Scrap <input type="checkbox"/>	Machining <input type="checkbox"/>	Small Fab <input type="checkbox"/>	Rec/Store/Packaging <input type="checkbox"/>																																																
			Use-as-is <input type="checkbox"/>	Thermoforming <input type="checkbox"/>	Finishing <input type="checkbox"/>	Supplier <input type="checkbox"/>																																																
			Work Order Update <input type="checkbox"/>	Large Fab <input type="checkbox"/>	Composite <input type="checkbox"/>	Other <input type="checkbox"/>																																																
Root Cause		Date	Step	Qty	Description of work order update or Non-conformance	Initial Chief Eng	Action Description	Sign & Date	Verification	QC Inspector																																												
Doc/Data <input type="checkbox"/>																																																						
Equip/Tooling <input type="checkbox"/>																																																						
Operator <input type="checkbox"/>																																																						
Material <input type="checkbox"/>																																																						
Offset/Setup <input type="checkbox"/>																																																						
Other <input type="checkbox"/>																																																						
Process <input type="checkbox"/>																																																						
Supplier <input type="checkbox"/>																																																						
Training <input type="checkbox"/>																																																						
Unauthorized <input type="checkbox"/>																																																						
FAULT CATEGORY																																																						
Landing Gear			Hardware			General																																																
Bending Passes Below Min <input type="checkbox"/>	Breaking <input type="checkbox"/>	Burrs <input type="checkbox"/>	Maintenance <input type="checkbox"/>	Set-up <input type="checkbox"/>	Centre Not Concentric to O/S <input type="checkbox"/>	Missing <input type="checkbox"/>	Contamination <input type="checkbox"/>	Mislabeled <input type="checkbox"/>	Supplier <input type="checkbox"/>	Cracks <input type="checkbox"/>	Size/Length <input type="checkbox"/>	Cut Too Short <input type="checkbox"/>	Off-Set <input type="checkbox"/>	Temperature/Cure <input type="checkbox"/>	Crushed/Crimp at Bending <input type="checkbox"/>	Spinning <input type="checkbox"/>	Documentation/Data <input type="checkbox"/>	Orientation Misread <input type="checkbox"/>	Weld <input type="checkbox"/>	Inspection Strip in Tube <input type="checkbox"/>	Threading <input type="checkbox"/>	Finish <input type="checkbox"/>	Out of Calibration <input type="checkbox"/>	Wrong Stock Pulled <input type="checkbox"/>	Other <input type="checkbox"/>	Positioned Wrong <input type="checkbox"/>	Wrong <input type="checkbox"/>	Inspection Incomplete <input type="checkbox"/>	Out of Sequence <input type="checkbox"/>	Outside Dimensions <input type="checkbox"/>	Over/Under tolerance <input type="checkbox"/>	Other <input type="checkbox"/>	Ripples on Inner Bend <input type="checkbox"/>	Drill Holes	Inspection Unqualified <input type="checkbox"/>	Part Lost <input type="checkbox"/>	Part Moved <input type="checkbox"/>	Raw Material <input type="checkbox"/>	Torque Waves in Extrusion <input type="checkbox"/>	Misaligned <input type="checkbox"/>	Instructions Incomplete/Unclear <input type="checkbox"/>	Jigs/Fixtures/Tooling <input type="checkbox"/>	Kit Incorrect <input type="checkbox"/>	Kit Missing <input type="checkbox"/>	Turning Sequence <input type="checkbox"/>	Ovalized <input type="checkbox"/>	Over/Undersized <input type="checkbox"/>	Kit Incorrect <input type="checkbox"/>	Kit Missing <input type="checkbox"/>	Wave/Twist in Tube <input type="checkbox"/>	Too Many <input type="checkbox"/>	Over/Undersized <input type="checkbox"/>	Kit Incorrect <input type="checkbox"/>	Kit Missing <input type="checkbox"/>

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Item ID: D407-667-205

Accept

N900040100

Setup Start

NS1**Revision ID:****Item Name:** Crosstube Aft

Stop

NS2**Start Date:** 05/06/2012 **Start Qty:** 1.00 ***1*****Cust Item ID:****Required Date:** 19/06/2012 **Req'd Qty:** 1.00 ***1*****Customer:****Reference:**

Approvals:	Process Plan:	Date:	Tooling:	Date:	Run	Start	*NR1*
						Stop	*NR2*

Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
140		0.00							
140	Crosstubes								
Crosstubes	Memo	0.00							
Crosstubes	1-Drill pilot holes in tube using drill Jig DT8583 & DT8584 as per Dwg D407-667-245. Drill all (3) top holes.								
	2-Drill and Ream all holes in tube to finish size using drill Jig DT8583 & DT8584 as per Dwg D407-667-245 Check dimensions between holes on all four sides.								
	3-Flip tube and switch drilling Jigs from right to left, left to right. Locate Jigs off existing holes using "T" pins.								
	4-Drill pilot holes using drill Jig DT8583 & DT8584 as per Dwg D407-667-245. Drill only the top (2) holes.								
	5-Drill & ream the top (2) holes to finish size using drill Jig DT8583 & DT8584 as per Dwg D407-667-245								
	6-Drill Aft rivet holes using drill Jig DT8789 as per Dwg D407-667-245. Note: Aft side has 3x top holes.								
	7-Drill Fwd rivet holes using drill Jig DT8789 as per Dwg D407-667-245. Drill only the top (3) holes.								
	8-C'sink holes as per Dwg D407-667-245. Allow rivet to sit below surface to compensate for paint.								
	9- Scribe tube to identify on the inner chamfer in the cuff D# and B#								
	10-Deburr & Inspect for surface damage. Repair damage within limits as per								

*Rm/MO**12-7-19*

NCR: Yes / No

DQA: Date:

WORK ORDER NON-CONFORMANCE / UPDATE

QA Closed: _____ Date: _____

Work Order: _____				DISPOSITION		AGAINST DEPARTMENT/PROCESS					
				Rework Scrap Use-as-is Work Order Update	Skid-tube Machining Thermoforming Large Fab	Crosstube Small Fab Finishing Composite	Prod. Eng. Coor. Rec/Store/Packaging Supplier Other	Engineering Quality			
Part No. _____ NCR No. _____											
Root Cause	Date	Step	Qty	Description of work order update or Non-conformance	Initial Chief Eng	Action Description	Sign & Date	Verification	QC Inspector		
Doc/Data											
Equip/Tooling											
Operator											
Material											
Offset/Setup											
Other											
Process											
Supplier											
Training											
Unauthorized											
FAULT CATEGORY											
Landing Gear <input type="checkbox"/> Bending Passes Below Min <input type="checkbox"/> Centre Not Concentric to O/S <input type="checkbox"/> Cracks <input type="checkbox"/> Crushed/Crimp at Bending <input type="checkbox"/> Inspection Strip in Tube <input type="checkbox"/> Other <input type="checkbox"/> Positioned Wrong <input type="checkbox"/> Ripples on Inner Bend <input type="checkbox"/> Torque Waves in Extrusion <input type="checkbox"/> Turning Sequence <input type="checkbox"/> Wave/Twist in Tube				Hardware <input type="checkbox"/> Breaking <input type="checkbox"/> Missing <input type="checkbox"/> Size/Length <input type="checkbox"/> Spinning <input type="checkbox"/> Threading <input type="checkbox"/> Wrong		General <input type="checkbox"/> Burrs <input type="checkbox"/> Contamination <input type="checkbox"/> Cut Too Short <input type="checkbox"/> Documentation/Data <input type="checkbox"/> Finish <input type="checkbox"/> Inspection Incomplete <input type="checkbox"/> Inspection Unqualified <input type="checkbox"/> Instructions Incomplete/Unclear <input type="checkbox"/> Jigs/Fixtures/Tooling <input type="checkbox"/> Kit Incorrect <input type="checkbox"/> Kit Missing		<input type="checkbox"/> Maintenance <input type="checkbox"/> Mislabeled <input type="checkbox"/> Off-Set <input type="checkbox"/> Orientation Misread <input type="checkbox"/> Out of Calibration <input type="checkbox"/> Out of Sequence <input type="checkbox"/> Outside Dimensions <input type="checkbox"/> Over/Under tolerance <input type="checkbox"/> Part Lost <input type="checkbox"/> Part Moved <input type="checkbox"/> Raw Material		<input type="checkbox"/> Set-up <input type="checkbox"/> Supplier <input type="checkbox"/> Temperature/Cure <input type="checkbox"/> Weld <input type="checkbox"/> Wrong Stock Pulled <input type="checkbox"/> Other	

Work Order ID 85317

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Item ID: D407-667-205

Accept

N900040100

Setup

Start

NS1

Revision ID:

Item Name: Crosstube Aft

Start Date: 05/06/2012 **Start Qty:** 1.00 *1*

Required Date: 19/06/2012 **Req'd Qty:** 1.00 *1*

Reference:

Cust Item ID:

Customer:

Approvals:	Process Plan: _____	Date: _____	Tooling: _____	Date: _____	Run	Start	*NR1*
	QC: _____	Date: _____	SPC (Y/N): _____	Date: _____		Stop	*NR2*

Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
Dwg D407-667-245									
150 *150* HandFXtube	Crosstubes Chemical Conversion Memo	0.00	PRO 17504						
Hand Finishing Crosstubes		0.00	AF	12-7-20					
160 *160* QC Quality Control	QC3- Inspect Part Finish Memo	0.00							
		0.00							
170 *170* QC Quality Control	QC5- Inspect part completeness to step on W/O Memo	0.00							
		0.00							

NCR: Yes / No

DQA: _____ Date: _____

WORK ORDER NON-CONFORMANCE / UPDATE

QA Closed: _____ Date: _____

Work Order:	DISPOSITION				AGAINST DEPARTMENT/PROCESS					
Part No.	Rework	<input type="checkbox"/>	Skid-tube	<input type="checkbox"/>	Crosstube	<input type="checkbox"/>	Prod. Eng. Coor.	<input type="checkbox"/>	Engineering	<input type="checkbox"/>
NCR No.	Scrap	<input type="checkbox"/>	Machining	<input type="checkbox"/>	Small Fab	<input type="checkbox"/>	Rec/Store/Packaging	<input type="checkbox"/>	Quality	<input type="checkbox"/>
	Use-as-is	<input type="checkbox"/>	Thermoforming	<input type="checkbox"/>	Finishing	<input type="checkbox"/>	Supplier	<input type="checkbox"/>		<input type="checkbox"/>
	Work Order Update	<input type="checkbox"/>	Large Fab	<input type="checkbox"/>	Composite	<input type="checkbox"/>	Other	<input type="checkbox"/>		<input type="checkbox"/>

Root Cause	Date	Step	Qty	Description of work order update or Non-conformance	Initial Chief Eng	Action Description	Sign & Date	Verification	QC Inspector
Doc/Data									
Equip/Tooling									
Operator									
Material									
Offset/Setup									
Other									
Process									
Supplier									
Training									
Unauthorized									

FAULT CATEGORY

Landing Gear		Hardware		General			
Bending Passes Below Min	<input type="checkbox"/>	Breaking	<input type="checkbox"/>	Burrs	<input type="checkbox"/>	Maintenance	<input type="checkbox"/>
Centre Not Concentric to O/S	<input type="checkbox"/>	Missing	<input type="checkbox"/>	Contamination	<input type="checkbox"/>	Mislabeled	<input type="checkbox"/>
Cracks	<input type="checkbox"/>	Size/Length	<input type="checkbox"/>	Cut Too Short	<input type="checkbox"/>	Off-Set	<input type="checkbox"/>
Crushed/Crimp at Bending	<input type="checkbox"/>	Spinning	<input type="checkbox"/>	Documentation/Data	<input type="checkbox"/>	Orientation Misread	<input type="checkbox"/>
Inspection Strip in Tube	<input type="checkbox"/>	Threading	<input type="checkbox"/>	Finish	<input type="checkbox"/>	Out of Calibration	<input type="checkbox"/>
Other	<input type="checkbox"/>	Wrong	<input type="checkbox"/>	Inspection Incomplete	<input type="checkbox"/>	Out of Sequence	<input type="checkbox"/>
Positioned Wrong	<input type="checkbox"/>			Inspection Unqualified	<input type="checkbox"/>	Outside Dimensions	<input type="checkbox"/>
Ripples on Inner Bend	<input type="checkbox"/>	Drill Holes	<input type="checkbox"/>	Instructions Incomplete/Unclear	<input type="checkbox"/>	Over/Under tolerance	<input type="checkbox"/>
Torque Waves in Extrusion	<input type="checkbox"/>	Misaligned	<input type="checkbox"/>	Jigs/Fixtures/Tooling	<input type="checkbox"/>	Part Lost	<input type="checkbox"/>
Turning Sequence	<input type="checkbox"/>	Ovalized	<input type="checkbox"/>	Kit Incorrect	<input type="checkbox"/>	Part Moved	<input type="checkbox"/>
Wave/Twist in Tube	<input type="checkbox"/>	Over/Undersized	<input type="checkbox"/>	Kit Missing	<input type="checkbox"/>	Raw Material	<input type="checkbox"/>
		Too Many	<input type="checkbox"/>				

Work Order ID 85317

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Item ID: D407-667-205

Accept

N900040100

Setup Start

NS1

Revision ID:

Item Name: Crosstube Aft

Start Date: 05/06/2012 Start Qty: 1.00 ***1***Required Date: 19/06/2012 Req'd Qty: 1.00 ***1***

Cust Item ID:

Customer:

Reference:

Approvals:	Process Plan:	Date:	Tooling:	Date:	Run	Start	*NR1*
	QC:	Date:	SPC (Y/N):	Date:		Stop	*NR2*

Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
180 *180* Outsource2	Outsource process - NDT per QSI038 4.1	0.00							
Outsource process - NDT	Memo Liquid Penetrant Inspection as per QSI 0380 Issue P/O: _____ LPN as per ASTM 1417 Level 2 Attach copy of NDT results to work order	0.00	Wf	U					
190 *190* Packaging Packaging	Packaging	0.00							
	Memo Ensure copy of NDT results attached to work order.	0.00							
200 *200* QC Quality Control	QC5- Inspect part completeness to step on W/O	0.00							12/07/23
	Memo	0.00							

NCR: Yes / No

WORK ORDER NON-COMPLIANCE / UPDATE

DQA: Date:

QA Closed: _____ Date: _____

NCR: Yes / No

DQA: _____ Date: _____

WORK ORDER NON-CONFORMANCE / UPDATE

QA Closed: _____ Date: _____

Work Order: _____	DISPOSITION	AGAINST DEPARTMENT/PROCESS					
Part No. _____	Rework <input type="checkbox"/>	Skid-tube <input type="checkbox"/>	Crosstube <input type="checkbox"/>	Prod. Eng. Coor. <input type="checkbox"/>	Engineering <input type="checkbox"/>		
NCR No. _____	Scrap <input type="checkbox"/>	Machining <input type="checkbox"/>	Small Fab <input type="checkbox"/>	Rec/Store/Packaging <input type="checkbox"/>	Quality <input type="checkbox"/>		
	Use-as-is <input type="checkbox"/>	Thermoforming <input type="checkbox"/>	Finishing <input type="checkbox"/>	Supplier <input type="checkbox"/>			
	Work Order Update <input type="checkbox"/>	Large Fab <input type="checkbox"/>	Composite <input type="checkbox"/>	Other <input type="checkbox"/>			

Root Cause	Date	Step	Qty	Description of work order update or Non-conformance	Initial Chief Eng	Action Description	Sign & Date	Verification	QC Inspector
Doc/Data									
Equip/Tooling									
Operator									
Material									
Offset/Setup									
Other									
Process									
Supplier									
Training									
Unauthorized									

FAULT CATEGORY

Landing Gear	Hardware	General	
Bending Passes Below Min	Breaking <input type="checkbox"/>	Burrs <input type="checkbox"/>	Maintenance <input type="checkbox"/>
Centre Not Concentric to O/S	Missing <input type="checkbox"/>	Contamination <input type="checkbox"/>	Mislabeled <input type="checkbox"/>
Cracks <input type="checkbox"/>	Size/Length <input type="checkbox"/>	Cut Too Short <input type="checkbox"/>	Off-Set <input type="checkbox"/>
Crushed/Crimp at Bending	Spinning <input type="checkbox"/>	Documentation/Data <input type="checkbox"/>	Orientation Misread <input type="checkbox"/>
Inspection Strip in Tube	Threading <input type="checkbox"/>	Finish <input type="checkbox"/>	Out of Calibration <input type="checkbox"/>
Other <input type="checkbox"/>	Wrong <input type="checkbox"/>	Inspection Incomplete <input type="checkbox"/>	Out of Sequence <input type="checkbox"/>
Positioned Wrong <input type="checkbox"/>	Drill Holes	Inspection Unqualified <input type="checkbox"/>	Outside Dimensions <input type="checkbox"/>
Ripples on Inner Bend <input type="checkbox"/>	Misaligned <input type="checkbox"/>	Instructions Incomplete/Unclear <input type="checkbox"/>	Over/Under tolerance <input type="checkbox"/>
Torque Waves in Extrusion <input type="checkbox"/>	Ovalized <input type="checkbox"/>	Jigs/Fixtures/Tooling <input type="checkbox"/>	Part Lost <input type="checkbox"/>
Turning Sequence <input type="checkbox"/>	Over/Undersized <input type="checkbox"/>	Kit Incorrect <input type="checkbox"/>	Part Moved <input type="checkbox"/>
Wave/Twist in Tube <input type="checkbox"/>	Too Many <input type="checkbox"/>	Kit Missing <input type="checkbox"/>	Raw Material <input type="checkbox"/>
			Set-up <input type="checkbox"/>
			Supplier <input type="checkbox"/>
			Temperature/Cure <input type="checkbox"/>
			Weld <input type="checkbox"/>
			Wrong Stock Pulled <input type="checkbox"/>
			Other <input type="checkbox"/>

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Item ID: D407-667-205

Accept

N900040100

Setup

Start

NS1

Revision ID:

Item Name: Crosstube Aft

Start Date: 05/06/2012 Start Qty: 1.00 ***1***Required Date: 19/06/2012 Req'd Qty: 1.00 ***1***

Cust Item ID:

Customer:

Reference:

Approvals:	Process Plan:	Date:	Tooling:	Date:	Run	Start	*NR1*
	QC:	Date:	SPC (Y/N):	Date:		Stop	*NR2*

Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
230		0.00							
230 Crosstubes	Crosstubes								
	Memo	0.00							
	1- Install chafing shield as per DEO D407-667-245. Top holes should be facing up.								
	A/R Proseal 890 Batch: <u>122441</u> EXP: <u>17/13</u>								
	2- Lightly scuff the bonded area using a 320 grit sand paper and clean the area with 41058 wash 'n' wipe								
	3-Install support with Scotch-Weld DP460 and install clamps as per DEO Dwg D407-667-245 using installation jig DT9025. Torque clamps as per dwg								
	A/R Scotch-Weld DP460 Batch: <u>121368</u> EXP: <u>13-04-13</u>								
	4-Install nut plates as per Dwg D407-667-245. Touch-up rivet heads with Imron paint.								

240

QC5- Inspect part completeness to step on W/O 0.00

240

QC

Quality Control

Memo 0.00

B 1207.31 B 1207.31

NCR: Yes / No

DQA: Date: .

WORK ORDER NON-CONFORMANCE / UPDATE

QA Closed: _____ Date: _____

Work Order: _____				DISPOSITION		AGAINST DEPARTMENT/PROCESS					
				Rework Scrap Use-as-is Work Order Update	Skid-tube Machining Thermoforming Large Fab	Crosstube Small Fab Finishing Composite	Prod. Eng. Coor. Rec/Store/Packaging Supplier Other	Engineering Quality			
Part No. _____ NCR No. _____											
Root Cause	Date	Step	Qty	Description of work order update or Non-conformance	Initial Chief Eng	Action Description	Sign & Date	Verification	QC Inspector		
Doc/Data											
Equip/Tooling											
Operator											
Material											
Offset/Setup											
Other											
Process											
Supplier											
Training											
Unauthorized											
FAULT CATEGORY											
Landing Gear <input type="checkbox"/> Bending Passes Below Min <input type="checkbox"/> Centre Not Concentric to O/S <input type="checkbox"/> Cracks <input type="checkbox"/> Crushed/Crimp at Bending <input type="checkbox"/> Inspection Strip in Tube <input type="checkbox"/> Other <input type="checkbox"/> Positioned Wrong <input type="checkbox"/> Ripples on Inner Bend <input type="checkbox"/> Torque Waves in Extrusion <input type="checkbox"/> Turning Sequence <input type="checkbox"/> Wave/Twist in Tube				Hardware <input type="checkbox"/> Breaking <input type="checkbox"/> Missing <input type="checkbox"/> Size/Length <input type="checkbox"/> Spinning <input type="checkbox"/> Threading <input type="checkbox"/> Wrong	General <input type="checkbox"/> Burrs <input type="checkbox"/> Contamination <input type="checkbox"/> Cut Too Short <input type="checkbox"/> Documentation/Data <input type="checkbox"/> Finish <input type="checkbox"/> Inspection Incomplete <input type="checkbox"/> Inspection Unqualified <input type="checkbox"/> Instructions Incomplete/Unclear <input type="checkbox"/> Jigs/Fixtures/Tooling <input type="checkbox"/> Kit Incorrect <input type="checkbox"/> Kit Missing	<input type="checkbox"/> Maintenance <input type="checkbox"/> Mislabeled <input type="checkbox"/> Off-Set <input type="checkbox"/> Orientation Misread <input type="checkbox"/> Out of Calibration <input type="checkbox"/> Out of Sequence <input type="checkbox"/> Outside Dimensions <input type="checkbox"/> Over/Under tolerance <input type="checkbox"/> Part Lost <input type="checkbox"/> Part Moved <input type="checkbox"/> Raw Material	<input type="checkbox"/> Set-up <input type="checkbox"/> Supplier <input type="checkbox"/> Temperature/Cure <input type="checkbox"/> Weld <input type="checkbox"/> Wrong Stock Pulled				

Work Order ID 85317

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Item ID: D407-667-205

Accept

Revision ID:

Item Name: Crosstube Aft

Start Date: 05/06/2012 **Start Qty:** 1.00 ***1***

Required Date: 19/06/2012 **Req'd Qty:** 1.00 ***1***

Reference:

N900040100

Setup

Start

NS1

Stop

NS2

Approvals:	Process Plan: _____	Date: _____	Tooling: _____	Date: _____	Run	Start	*NR1*
	QC: _____	Date: _____	SPC (Y/N): _____	Date: _____		Stop	*NR2*

Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
250 *250* Packaging	Pick Kit	0.00							<i>C128101</i>
	Memo	0.00							

260 QC4- 100% Inspect kits for completeness

0.00
DAS 16 7/08/01

260
QC
Quality Control

270 *270* Packaging	Packaging	0.00	<i>C128101</i>
	Memo	0.00	
	Identify and in kanban rack Location: _____		

NCR: Yes / No

WORK ORDER NON-COMPLIANCE / UPDATE

DQA: Date: .

QA Closed: _____ Date: _____

Work Order: _____			DISPOSITION		AGAINST DEPARTMENT/PROCESS					
			Rework Scrap Use-as-is Work Order Update	Skid-tube Machining Thermoforming Large Fab	Crosstube Small Fab Finishing Composite	Prod. Eng. Coor. Rec/Store/Packaging Supplier Other	Engineering Quality			
Part No. _____ NCR No. _____										
Root Cause	Date	Step	Qty	Description of work order update or Non-conformance	Initial Chief Eng	Action Description	Sign & Date	Verification	QC Inspector	
Doc/Data										
Equip/Tooling										
Operator										
Material										
Offset/Setup										
Other										
Process										
Supplier										
Training										
Unauthorized										
FAULT CATEGORY										
Landing Gear <input type="checkbox"/> Bending Passes Below Min <input type="checkbox"/> Centre Not Concentric to O/S <input type="checkbox"/> Cracks <input type="checkbox"/> Crushed/Crimp at Bending <input type="checkbox"/> Inspection Strip in Tube <input type="checkbox"/> Other <input type="checkbox"/> Positioned Wrong <input type="checkbox"/> Ripples on Inner Bend <input type="checkbox"/> Torque Waves in Extrusion <input type="checkbox"/> Turning Sequence <input type="checkbox"/> Wave/Twist in Tube				Hardware <input type="checkbox"/> Breaking <input type="checkbox"/> Missing <input type="checkbox"/> Size/Length <input type="checkbox"/> Spinning <input type="checkbox"/> Threading <input type="checkbox"/> Wrong	General <input type="checkbox"/> Burrs <input type="checkbox"/> Contamination <input type="checkbox"/> Cut Too Short <input type="checkbox"/> Documentation/Data <input type="checkbox"/> Finish <input type="checkbox"/> Inspection Incomplete <input type="checkbox"/> Inspection Unqualified <input type="checkbox"/> Instructions Incomplete/Unclear <input type="checkbox"/> Jigs/Fixtures/Tooling <input type="checkbox"/> Kit Incorrect <input type="checkbox"/> Kit Missing	<input type="checkbox"/> Maintenance <input type="checkbox"/> Mislabeled <input type="checkbox"/> Off-Set <input type="checkbox"/> Orientation Misread <input type="checkbox"/> Out of Calibration <input type="checkbox"/> Out of Sequence <input type="checkbox"/> Outside Dimensions <input type="checkbox"/> Over/Under tolerance <input type="checkbox"/> Part Lost <input type="checkbox"/> Part Moved <input type="checkbox"/> Raw Material	<input type="checkbox"/> Set-up <input type="checkbox"/> Supplier <input type="checkbox"/> Temperature/Cure <input type="checkbox"/> Weld <input type="checkbox"/> Wrong Stock Pulled <input type="checkbox"/> Other			

Work Order ID 85317

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85317

Page 9

Item ID: D407-667-205

Accept

N900040100

Setup

Start

NS1**Revision ID:****Item Name:** Crosstube Aft

Stop

NS2**Start Date:** 05/06/2012 **Start Qty:** 1.00 ***1*****Cust Item ID:****Required Date:** 19/06/2012 **Req'd Qty:** 1.00 ***1*****Customer:****Reference:**

Approvals:	Process Plan: _____	Date: _____	Tooling: _____	Date: _____	Run	Start	*NR1*
	QC: _____	Date: _____	SPC (Y/N): _____	Date: _____		Stop	*NR2*

Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
280 *280* QC Quality Control	QC21- Final Inspection - Work Order Release Memo	0.00							12/8/12 JH MLJ 12/08/01

NCR: Yes / No

DQA: _____ Date: _____

WORK ORDER NON-CONFORMANCE / UPDATE

QA Closed: _____ Date: _____

Work Order: _____			DISPOSITION		AGAINST DEPARTMENT/PROCESS					
			Rework <input type="checkbox"/>	Skid-tube <input type="checkbox"/>	Crosstube <input type="checkbox"/>	Prod. Eng. Coor. <input type="checkbox"/>	Engineering <input type="checkbox"/>			
			Scrap <input type="checkbox"/>	Machining <input type="checkbox"/>	Small Fab <input type="checkbox"/>	Rec/Store/Packaging <input type="checkbox"/>	Quality <input type="checkbox"/>			
			Use-as-is <input type="checkbox"/>	Thermoforming <input type="checkbox"/>	Finishing <input type="checkbox"/>	Supplier <input type="checkbox"/>				
			Work Order Update <input type="checkbox"/>	Large Fab <input type="checkbox"/>	Composite <input type="checkbox"/>	Other <input type="checkbox"/>				
Root Cause	Date	Step	Qty	Description of work order update or Non-conformance	Initial Chief Eng	Action Description	Sign & Date	Verification	QC Inspector	
Doc/Data										
Equip/Tooling										
Operator										
Material										
Offset/Setup										
Other										
Process										
Supplier										
Training										
Unauthorized										
FAULT CATEGORY										
Landing Gear				Hardware		General				
				Breaking <input type="checkbox"/>	Burrs <input type="checkbox"/>	Maintenance <input type="checkbox"/>	Set-up <input type="checkbox"/>			
				Missing <input type="checkbox"/>	Contamination <input type="checkbox"/>	Mislabeled <input type="checkbox"/>	Supplier <input type="checkbox"/>			
				Size/Length <input type="checkbox"/>	Cut Too Short <input type="checkbox"/>	Off-Set <input type="checkbox"/>	Temperature/Cure <input type="checkbox"/>			
				Spinning <input type="checkbox"/>	Documentation/Data <input type="checkbox"/>	Orientation Misread <input type="checkbox"/>	Weld <input type="checkbox"/>			
				Threading <input type="checkbox"/>	Finish <input type="checkbox"/>	Out of Calibration <input type="checkbox"/>	Wrong Stock Pulled <input type="checkbox"/>			
				Wrong <input type="checkbox"/>	Inspection Incomplete <input type="checkbox"/>	Out of Sequence <input type="checkbox"/>				
					Inspection Unqualified <input type="checkbox"/>	Outside Dimensions <input type="checkbox"/>				
					Instructions Incomplete/Unclear <input type="checkbox"/>	Over/Under tolerance <input type="checkbox"/>				
					Jigs/Fixtures/Tooling <input type="checkbox"/>	Part Lost <input type="checkbox"/>				
					Kit Incorrect <input type="checkbox"/>	Part Moved <input type="checkbox"/>				
					Kit Missing <input type="checkbox"/>	Raw Material <input type="checkbox"/>				
Drill Holes										
				Misaligned <input type="checkbox"/>						
				Ovalized <input type="checkbox"/>						
				Over/Undersized <input type="checkbox"/>						
				Too Many <input type="checkbox"/>						

Picklist Print

June-05-12 3:37:02 PM

Work Order ID: 85317

Parent Item: D407-667-205

Parent Item Name: Crosstube Aft

85317
D407-667-205

Start Date: 05/06/2012

Start Qty: 1.00

Required Date: 19/06/2012

Required Qty: 1.00

Comments:
 IPP Rev:C 05.09.02 Add holes for compatibility with Bell SkidtubesKJ/JLM
 IPP Rev:D Added Magnobond,Rubber Cushion & Clamps 07-02-19
 JLM

****CHANGE TO CHG 005 - IF USING D2894-1 B35578 OR GREATER****
 IPP Rev:E 08-05-22 add comment in seq. 6 and QC15 and QC5 DD verified by:EC

IPP Rev:F 08-06-12 add comment in seq. 24 DD verified by:EC

IPP Rev:G 08-08-19 revE as per dwg DD verified by:EC

IPP Rev H 09.01.06 ECN 08-562 EC verified by:DD IPP Rev:I
 10.04.07 revise route seq. in bom DD verified by:JLM IPP Rev J 11.04.26
 removed abrasion strip ecn 11-551 EC verified
 by:DD

IPP REV:K

11.10.03 DEO D407-667-245-F-2 DD verf:EC

Component Item ID/ Item Name	Replacement Item ID	Mfg/ Purch	Bin Item	Primary Location	Last Location	Route Seq ID	Unit of Measure	Qty on Hand	Qty per Kit	Total Qty	Qty Issued	Date Issued	Status
D407-667-205TRN		Manufactured	No			110	Each	0.0000	1	1			
D407-667-205TRN													
Crosstube Turning Detail													
AN960JD516	NAS1149D0563J	Purchased	No			230	Each	0.0000	18	18			
AN960.JD516													
Washer													
D2873-043		Manufactured	No			230	Each	40.0000	2	2			
D2873-043													
Nut Plate Assembly													

Location	Loc Qty	Loc Code
LG052	40	
72644	2	
(82949)	38	(2)

NCR: Yes / No

DQA: _____ Date: _____

WORK ORDER NON-CONFORMANCE / UPDATE

QA Closed: _____ Date: _____

Work Order: _____ Part No. _____ NCR No. _____				DISPOSITION Rework <input type="checkbox"/> Scrap <input type="checkbox"/> Use-as-is <input type="checkbox"/> Work Order Update <input type="checkbox"/>		AGAINST DEPARTMENT/PROCESS Skid-tube <input type="checkbox"/> Machining <input type="checkbox"/> Thermoforming <input type="checkbox"/> Large Fab <input type="checkbox"/> Crosstube <input type="checkbox"/> Small Fab <input type="checkbox"/> Finishing <input type="checkbox"/> Composite <input type="checkbox"/> Prod. Eng. Coor. <input type="checkbox"/> Rec/Store/Packaging <input type="checkbox"/> Supplier <input type="checkbox"/> Other <input type="checkbox"/> Engineering Quality <input type="checkbox"/>						
Root Cause	Date	Step	Qty	Description of work order update or Non-conformance		Initial Chief Eng	Action Description		Sign & Date	Verification	QC Inspector	
Doc/Data												
Equip/Tooling												
Operator												
Material												
Offset/Setup												
Other												
Process												
Supplier												
Training												
Unauthorized												
FAULT CATEGORY												
Landing Gear <input type="checkbox"/> Bending Passes Below Min <input type="checkbox"/> Centre Not Concentric to O/S <input type="checkbox"/> Cracks <input type="checkbox"/> Crushed/Crimp at Bending <input type="checkbox"/> Inspection Strip in Tube <input type="checkbox"/> Other <input type="checkbox"/> Positioned Wrong <input type="checkbox"/> Ripples on Inner Bend <input type="checkbox"/> Torque Waves in Extrusion <input type="checkbox"/> Turning Sequence <input type="checkbox"/> Wave/Twist in Tube	Hardware <input type="checkbox"/> Breaking <input type="checkbox"/> Missing <input type="checkbox"/> Size/Length <input type="checkbox"/> Spinning <input type="checkbox"/> Threading <input type="checkbox"/> Wrong			General <input type="checkbox"/> Burrs <input type="checkbox"/> Contamination <input type="checkbox"/> Cut Too Short <input type="checkbox"/> Documentation/Data <input type="checkbox"/> Finish <input type="checkbox"/> Inspection Incomplete <input type="checkbox"/> Inspection Unqualified <input type="checkbox"/> Instructions Incomplete/Unclear <input type="checkbox"/> Jigs/Fixtures/Tooling <input type="checkbox"/> Kit Incorrect <input type="checkbox"/> Kit Missing			<input type="checkbox"/> Maintenance <input type="checkbox"/> Mislabeled <input type="checkbox"/> Off-Set <input type="checkbox"/> Orientation Misread <input type="checkbox"/> Out of Calibration <input type="checkbox"/> Out of Sequence <input type="checkbox"/> Outside Dimensions <input type="checkbox"/> Over/Under tolerance <input type="checkbox"/> Part Lost <input type="checkbox"/> Part Moved <input type="checkbox"/> Raw Material			<input type="checkbox"/> Set-up <input type="checkbox"/> Supplier <input type="checkbox"/> Temperature/Cure <input type="checkbox"/> Weld <input type="checkbox"/> Wrong Stock Pulled <input type="checkbox"/> Other		
	Drill Holes											

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Page 2

Work Order ID: 85317

85317

Parent Item: D407-667-205

D407-667-205

Parent Item Name: Crosstube Aft

Start Date: 05/06/2012

Required Date: 19/06/2012

Start Qty: 1.00

Required Qty: 1.00

D2873-045

Manufactured No

230

Each

33.0000

2

2

**

AS 12-7-25

D2873-045

Nut Plate Assembly

<u>Location</u>	<u>Loc Qty</u>	<u>Loc Code</u>
LG052	33	
82947	33	

D2894-1

Manufactured No

230

Each

7.0000

1

1

**

②
W 12-07-27

D2894-1

2.750 Support

<u>Location</u>	<u>Loc Qty</u>	<u>Loc Code</u>
LG052	7	
75212	1	
82007	6	

D3190-1

Manufactured No

230

Each

41.0000

2

2

**

AS 12-7-28

D3190-1

Chafing Shield

<u>Location</u>	<u>Loc Qty</u>	<u>Loc Code</u>
LG053	23	
75947	23	
LG055	18	
12576	18	

NCR: Yes / No

DQA: _____ Date: _____

WORK ORDER NON-CONFORMANCE / UPDATE

QA Closed: _____ Date: _____

Work Order: _____			DISPOSITION			AGAINST DEPARTMENT/PROCESS					
			Rework <input type="checkbox"/>	Skid-tube <input type="checkbox"/>	Crosstube <input type="checkbox"/>	Prod. Eng. Coor. <input type="checkbox"/>	Engineering <input type="checkbox"/>				
			Scrap <input type="checkbox"/>	Machining <input type="checkbox"/>	Small Fab <input type="checkbox"/>	Rec/Store/Packaging <input type="checkbox"/>	Quality <input type="checkbox"/>				
			Use-as-is <input type="checkbox"/>	Thermoforming <input type="checkbox"/>	Finishing <input type="checkbox"/>	Supplier <input type="checkbox"/>	Other <input type="checkbox"/>				
			Work Order Update <input type="checkbox"/>	Large Fab <input type="checkbox"/>	Composite <input type="checkbox"/>						
Root Cause	Date	Step	Qty	Description of work order update or Non-conformance	Initial Chief Eng	Action Description	Sign & Date	Verification	QC Inspector		
Doc/Data											
Equip/Tooling											
Operator											
Material											
Offset/Setup											
Other											
Process											
Supplier											
Training											
Unauthorized											
FAULT CATEGORY											
Landing Gear <input type="checkbox"/> Bending Passes Below Min <input type="checkbox"/> Centre Not Concentric to O/S <input type="checkbox"/> Cracks <input type="checkbox"/> Crushed/Crimp at Bending <input type="checkbox"/> Inspection Strip in Tube <input type="checkbox"/> Other <input type="checkbox"/> Positioned Wrong <input type="checkbox"/> Ripples on Inner Bend <input type="checkbox"/> Torque Waves in Extrusion <input type="checkbox"/> Turning Sequence <input type="checkbox"/> Wave/Twist in Tube				Hardware <input type="checkbox"/> Breaking <input type="checkbox"/> Missing <input type="checkbox"/> Size/Length <input type="checkbox"/> Spinning <input type="checkbox"/> Threading <input type="checkbox"/> Wrong Drill Holes <input type="checkbox"/> Misaligned <input type="checkbox"/> Ovalized <input type="checkbox"/> Over/Undersized <input type="checkbox"/> Too Many		General <input type="checkbox"/> Burrs <input type="checkbox"/> Contamination <input type="checkbox"/> Cut Too Short <input type="checkbox"/> Documentation/Data <input type="checkbox"/> Finish <input type="checkbox"/> Inspection Incomplete <input type="checkbox"/> Inspection Unqualified <input type="checkbox"/> Instructions Incomplete/Unclear <input type="checkbox"/> Jigs/Fixtures/Tooling <input type="checkbox"/> Kit Incorrect <input type="checkbox"/> Kit Missing				<input type="checkbox"/> Maintenance <input type="checkbox"/> Mislabeled <input type="checkbox"/> Off-Set <input type="checkbox"/> Orientation Misread <input type="checkbox"/> Out of Calibration <input type="checkbox"/> Out of Sequence <input type="checkbox"/> Outside Dimensions <input type="checkbox"/> Over/Under tolerance <input type="checkbox"/> Part Lost <input type="checkbox"/> Part Moved <input type="checkbox"/> Raw Material	
										<input type="checkbox"/> Set-up <input type="checkbox"/> Supplier <input type="checkbox"/> Temperature/Cure <input type="checkbox"/> Weld <input type="checkbox"/> Wrong Stock Pulled	
										<input type="checkbox"/> Other	

Picklist Print

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Page 3

Work Order ID: 85317

Parent Item: D407-667-205

Parent Item Name: Crosstube Aft

85317
D407-667-205

Start Date: 05/06/2012

Required Date: 19/06/2012

Start Qty: 1.00

Required Qty: 1.00

D3595-063-450

Manufactured No

230

Each

179.8095

2

2

**

D3595-063-450

RUBBER CUSHION

W 12-07-27

<u>Location</u>	<u>Loc Qty</u>	<u>Loc Code</u>
LG	60	
82511	60	
LG051	109.7	
80161	1.7	
84715	108	
MAT052	10.109474	
67353	2	
68893	6	
70113	0.56	
71354	0.2	
74113	0.349474	
75597	1	

MS20601-AD4W8

Purchased No

230

Each

144.0000

14

**

MS20601-AD4W8

RIVET

A8 12-7-25

<u>Location</u>	<u>Loc Qty</u>	<u>Loc Code</u>
LG051	33	
121017	33	
ST314	100	
121827	100	(14)
ST322	11	
121255	11	

NCR: Yes / No

DQA: _____ Date: _____

WORK ORDER NON-CONFORMANCE / UPDATE

QA Closed: _____ Date: _____

Work Order:	DISPOSITION				AGAINST DEPARTMENT/PROCESS				
Part No.	Rework	Skid-tube	Crosstube	Prod. Eng. Coor.	Engineering				
NCR No.	Scrap	Machining	Small Fab	Rec/Store/Packaging	Quality				
	Use-as-is	Thermoforming	Finishing	Supplier					
	Work Order Update	Large Fab	Composite	Other					

Root Cause	Date	Step	Qty	Description of work order update or Non-conformance	Initial Chief Eng	Action Description	Sign & Date	Verification	QC Inspector
Doc/Data									
Equip/Tooling									
Operator									
Material									
Offset/Setup									
Other									
Process									
Supplier									
Training									
Unauthorized									

FAULT CATEGORY

Landing Gear	Hardware	General		
<input type="checkbox"/> Bending Passes Below Min <input type="checkbox"/> Centre Not Concentric to O/S <input type="checkbox"/> Cracks <input type="checkbox"/> Crushed/Crimp at Bending <input type="checkbox"/> Inspection Strip in Tube <input type="checkbox"/> Other <input type="checkbox"/> Positioned Wrong <input type="checkbox"/> Ripples on Inner Bend <input type="checkbox"/> Torque Waves in Extrusion <input type="checkbox"/> Turning Sequence <input type="checkbox"/> Wave/Twist in Tube	<input type="checkbox"/> Breaking <input type="checkbox"/> Missing <input type="checkbox"/> Size/Length <input type="checkbox"/> Spinning <input type="checkbox"/> Threading <input type="checkbox"/> Wrong	<input type="checkbox"/> Burrs <input type="checkbox"/> Contamination <input type="checkbox"/> Cut Too Short <input type="checkbox"/> Documentation/Data <input type="checkbox"/> Finish <input type="checkbox"/> Inspection Incomplete <input type="checkbox"/> Inspection Unqualified <input type="checkbox"/> Instructions Incomplete/Unclear <input type="checkbox"/> Jigs/Fixtures/Tooling <input type="checkbox"/> Kit Incorrect <input type="checkbox"/> Kit Missing	<input type="checkbox"/> Maintenance <input type="checkbox"/> Mislabeled <input type="checkbox"/> Off-Set <input type="checkbox"/> Orientation Misread <input type="checkbox"/> Out of Calibration <input type="checkbox"/> Out of Sequence <input type="checkbox"/> Outside Dimensions <input type="checkbox"/> Over/Under tolerance <input type="checkbox"/> Part Lost <input type="checkbox"/> Part Moved <input type="checkbox"/> Raw Material	<input type="checkbox"/> Set-up <input type="checkbox"/> Supplier <input type="checkbox"/> Temperature/Cure <input type="checkbox"/> Weld <input type="checkbox"/> Wrong Stock Pulled
	Drill Holes			<input type="checkbox"/> Other
	<input type="checkbox"/> Misaligned <input type="checkbox"/> Ovalized <input type="checkbox"/> Over/Undersized <input type="checkbox"/> Too Many			

Picklist Print

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Page 4

Work Order ID: 85317**Parent Item:** D407-667-205**Parent Item Name:** Crosstube Aft

85317
D407-667-205

Start Date: 05/06/2012**Start Qty:** 1.00**Required Date:** 19/06/2012**Required Qty:** 1.00

MS21920-22

Purchased

No

230

Each

48.0000

4

4

**

MS21920-22

Clamp(per MIL-DTL-8783C)

12-7-28

<u>Location</u>	<u>Loc Qty</u>	<u>Loc Code</u>
LG	1	
119545	1	
LG050	47	
116207	7	
117506	1	
118186	8	
120631	31	

MS21920-25

Purchased

No

230

Each

123.0000

2

**

MS21920-25

Clamp(per MIL-DTL-8783C)

12-07-27

<u>Location</u>	<u>Loc Qty</u>	<u>Loc Code</u>
LG050	75	
116264	2	
117998	4	
118142	4	
119339	2	
119746	2	
120475	7	
120920	54	
LG051	48	
121583	48	

R# 122204

NCR: Yes / No

WORK ORDER NON-CONFORMANCE / UPDATE

DQA: _____ Date: _____

QA Closed: _____ Date: _____

Work Order: _____			DISPOSITION		AGAINST DEPARTMENT/PROCESS					
			Rework <input type="checkbox"/>	Skid-tube <input type="checkbox"/>	Crosstube <input type="checkbox"/>	Prod. Eng. Coor. <input type="checkbox"/>	Engineering <input type="checkbox"/>			
			Scrap <input type="checkbox"/>	Machining <input type="checkbox"/>	Small Fab <input type="checkbox"/>	Rec/Store/Packaging <input type="checkbox"/>	Quality <input type="checkbox"/>			
			Use-as-is <input type="checkbox"/>	Thermoforming <input type="checkbox"/>	Finishing <input type="checkbox"/>	Supplier <input type="checkbox"/>	Other <input type="checkbox"/>			
			Work Order Update <input type="checkbox"/>	Large Fab <input type="checkbox"/>	Composite <input type="checkbox"/>					
Root Cause	Date	Step	Qty	Description of work order update or Non-conformance	Initial Chief Eng	Action Description	Sign & Date	Verification	QC Inspector	
Doc/Data										
Equip/Tooling										
Operator										
Material										
Offset/Setup										
Other										
Process										
Supplier										
Training										
Unauthorized										
FAULT CATEGORY										
Landing Gear				Hardware		General				
<input type="checkbox"/> Bending Passes Below Min <input type="checkbox"/> Centre Not Concentric to O/S <input type="checkbox"/> Cracks <input type="checkbox"/> Crushed/Crimp at Bending <input type="checkbox"/> Inspection Strip in Tube <input type="checkbox"/> Other <input type="checkbox"/> Positioned Wrong <input type="checkbox"/> Ripples on Inner Bend <input type="checkbox"/> Torque Waves in Extrusion <input type="checkbox"/> Turning Sequence <input type="checkbox"/> Wave/Twist in Tube				<input type="checkbox"/> Breaking <input type="checkbox"/> Missing <input type="checkbox"/> Size/Length <input type="checkbox"/> Spinning <input type="checkbox"/> Threading <input type="checkbox"/> Wrong		<input type="checkbox"/> Burrs <input type="checkbox"/> Contamination <input type="checkbox"/> Cut Too Short <input type="checkbox"/> Documentation/Data <input type="checkbox"/> Finish <input type="checkbox"/> Inspection Incomplete <input type="checkbox"/> Inspection Unqualified <input type="checkbox"/> Instructions Incomplete/Unclear <input type="checkbox"/> Jigs/Fixtures/Tooling <input type="checkbox"/> Kit Incorrect <input type="checkbox"/> Kit Missing				
				Drill Holes						
				<input type="checkbox"/> Misaligned <input type="checkbox"/> Ovalized <input type="checkbox"/> Over/Undersized <input type="checkbox"/> Too Many						
<input type="checkbox"/> Maintenance <input type="checkbox"/> Mislabeled <input type="checkbox"/> Off-Set <input type="checkbox"/> Orientation Misread <input type="checkbox"/> Out of Calibration <input type="checkbox"/> Out of Sequence <input type="checkbox"/> Outside Dimensions <input type="checkbox"/> Over/Under tolerance <input type="checkbox"/> Part Lost <input type="checkbox"/> Part Moved <input type="checkbox"/> Raw Material										
<input type="checkbox"/> Set-up <input type="checkbox"/> Supplier <input type="checkbox"/> Temperature/Cure <input type="checkbox"/> Weld <input type="checkbox"/> Wrong Stock Pulled										
<input type="checkbox"/> Other										

Picklist Print

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Page 5

Work Order ID: 85317**Parent Item:** D407-667-205**Parent Item Name:** Crosstube Aft***85317***
D407-667-205**Start Date:** 05/06/2012**Start Qty:** 1.00**Required Date:** 19/06/2012**Required Qty:** 1.00

AN5-10A

AN5-10A
BoltPurchased No 250 Each 215.0000 10 10
** *M122161*

<u>Location</u>	<u>Loc Qty</u>	<u>Loc Code</u>
ST337	215	
118191	80	
121181	35	
121243	100	

AN5-32A

AN5-32A
BoltPurchased No 250 Each 245.0000 4 4
** *C*

<u>Location</u>	<u>Loc Qty</u>	<u>Loc Code</u>
ST339	145	
119862	50	
120423	75	
120910	20	
ST340	100	
121541	100	

M120723

AN5-34A

AN5-34A
BoltPurchased No 250 Each 64.0000 4 4
** *C12/8/010*

<u>Location</u>	<u>Loc Qty</u>	<u>Loc Code</u>
339	25	
121181	25	
ST339	39	
120422	39	

120422

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Shop Packet Print

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Dart Aerospace Ltd

W/O:		WORK ORDER CHANGES						
DATE	STEP	PROCEDURE CHANGE		By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____
 Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

NOTE: Date & initial all entries

Picklist.Print

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Page 6

Work Order ID: 85317**Parent Item:** D407-667-205**Parent Item Name:** Crosstube Aft***85317***
D407-667-205**Start Date:** 05/06/2012**Required Date:** 19/06/2012**Start Qty:** 1.00**Required Qty:** 1.00

MS21042LS

Purchased

No

250

Each

1,409.000

4

4

**

MS2104215
Nut

<u>Location</u>	<u>Loc Qty</u>	<u>Loc Code</u>
300	500	
121652	500	
ST300	909	
108827	8	
116105	5	
116548	43	
117611	18	
119109	827	
17651	8	
		119109

Dart Aerospace Ltd

W/O:		WORK ORDER CHANGES							
DATE	STEP	PROCEDURE CHANGE			By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

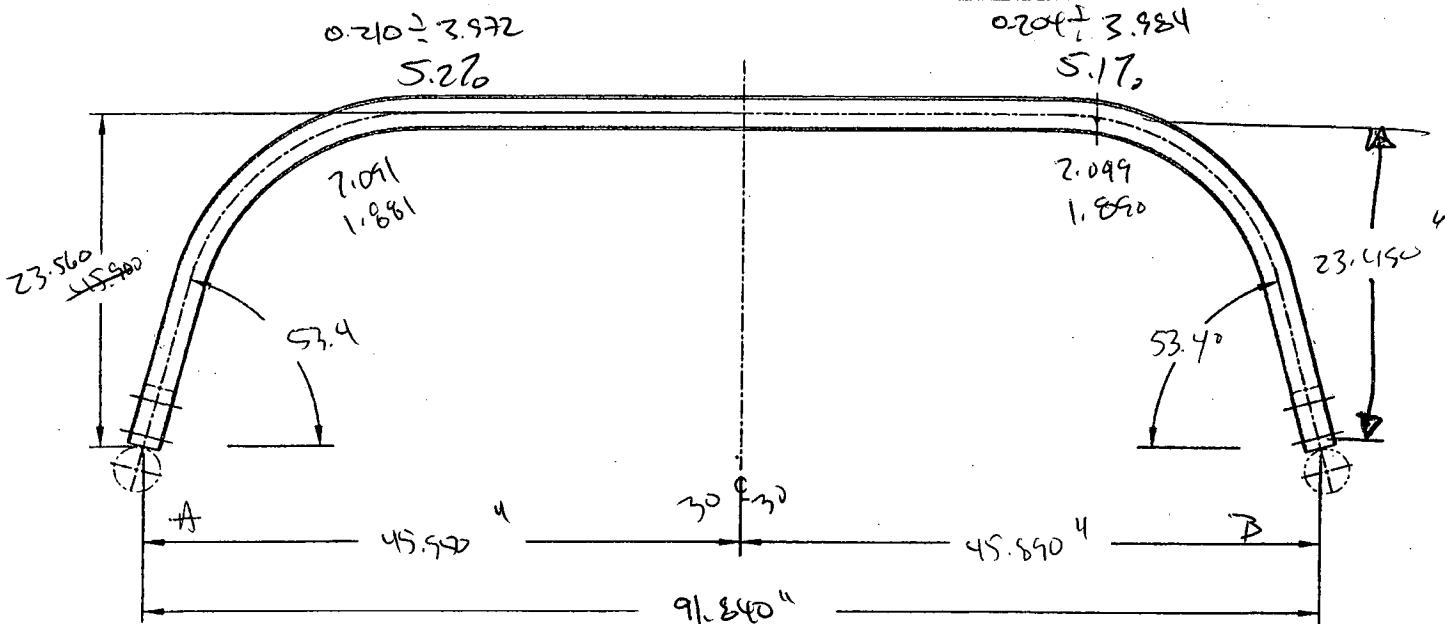
Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____
 Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

NOTE: Date & initial all entries

DART AEROSPACE LTD	Work Order:	85317
Description: Crosstube High Aft (407)	Part Number:	D407-667-205
Inspection Dwg: D407-667-245 Rev: F		Page 1 of 1

Required Dimension	Min	Max
Height	23.39	23.65
1/2 Span	45.79	46.05
Angle	54	56
Total Span	91.58	92.100



Comments
Sine A = 5.27 crash \oplus 30 Passes.
Sine B = 5.17 crash \oplus 30 Passes
Acceptable QP R2/217 QSI 042

QC15 Inspection	
Date	17/09/17 8:00

Rev	Date	Change	Revised by	Approved
A	07.02.06	New Issue	KJ/JM	
B	09.06.22	Dwg Rev updated	KJ	
C	11.08.22	Dimensions updated	KJ	
D	11.09.30	Dimensions updated	KJ	RE

Item	QTY	PART NUMBER	DESCRIPTION
1	X	D407-667-245	CROSSTUBE ASSEMBLY (407 HIGH AFT)
2	1	D6011-115	CROSSTUBE
3	2	D2856-400-773	ABRASION STRIP
4	2	D2873-043	NUT PLATE
5	2	D2873-045	NUT PLATE
6	1	D2894-1	SUPPORT
7	2	D3190-1	CHAFING SHIELD
8	2	D3595-063-430	RUBBER CUSHION
9	14	MS20601AD4W8	RIVET (OR NAS9302B-4-8)
10	4	MS21920-22	CLAMP
11	2	MS21920-25	CLAMP (OR MS21920-24)
12	A/R	MAGNOBOND 6398	ROCKWELL SPECIFICATION RBO-120-023 ADHESIVE (TEXTRON/BELL SPEC. 299-947- 100, TYPE II, CLASS 2 ADHESIVE)

GENERAL NOTES:

- 1) MATERIAL: MANUFACTURED FROM D6011-115
FINISHED LENGTH = 112.91±0.020
- 2) FINISH: CHEMICAL CONVERSION COAT PER DART QSI 005 4.1
PRIME INSIDE AND OUTSIDE PER DART QSI 005 4.2
PAINT OUTSIDE PER DART QSI 005 4.2
- 3) TOLERANCES ARE PER DART QSI 018 UNLESS OTHERWISE NOTED.
- 4) UNITS: INCHES UNLESS OTHERWISE NOTED.
- 5) BREAK SHARP EDGES: .005 TO 0.010 MAX.
- 6) IDENTIFICATION: SCRIBE DART PART NUMBER "D407-667-245" AND BATCH NUMBER ON
INSIDE OF CUFF USING VIBRATING STYLUS.
- 7) WEIGHT: 27.7 lbs
- 8) PART IS SYMMETRIC ABOUT CENTERLINE.
- 9) RUN-OFF PART. BLEND OUT EDGE LONGITUDINALLY, TRANSITION SHOULD BE SMOOTH.
- 10) BEND PROGRESSIVELY WITH A MINIMUM OF 6 PASSES. MAXIMUM TUBE FLATTENING DUE TO
BENDING IS 6% BASED ON O.D.
- 11) LIQUID PENETRANT INSPECT OUTSIDE SURFACE OF CROSSTUBE PER QSI 038.
- 12) INSTALL D2894-1 CENTER SUPPORT USING A 0.03" TO 0.06" THICK LAYER OF MAGNOBOND
6398 PER QSI 015. LET CURE FOR 12 HOURS AFTER INSTALLATION AND PRIOR TO
PACKAGING.
- 13) INSTALL MS21920-25 CLAMPS WITH D3595-063-430 RUBBER CUSHIONS TO SECURE D2894-1
SUPPORT ON TOP SIDE OF THE CROSSTUBE. ENSURE CLAMPS ARE OPPOSITE CROSSTUBE
SUPPORT.
NOTE: MS21920-24 CLAMPS CAN BE USED TO ACCOMMODATE VARYING DIAMETERS.
ENSURE THERE IS A MINIMUM OF 1.5 THREADS IN SAFETY ON THE NUTS.
- 14) EXTREME CARE MUST BE TAKEN TO PROTECT THE OUTSIDE SURFACE OF THE TUBE. THE
OUTSIDE SURFACE MUST BE SMOOTH AND FREE FROM SURFACE DEFECTS SUCH AS
SCRATCHES, NICKS, OR DENTS. DEFECTS UP TO 0.005" MAY BE BLENDED OUT
LONGITUDINALLY. CIRCUMFERENTIAL GRIND MARKS ARE UNACCEPTABLE.
- 15) INSTALL D2856-400-773 ABRASION STRIP WITH A 0.13 (REF) GAP ON BOTTOM SIDE OF
CROSSTUBE, PER QSI 035.
- 16) INSTALL D3190-1 CHAFING SHIELDS SO THAT OVERLAP IS ON BOTTOM SIDE OF CROSSTUBE
OPPOSITE D2894-1 SUPPORT.
- 17) TORQUE CLAMPS 80 TO 100 IN-LB. ENSURE AT LEAST 1.5 THREADS ARE SHOWING IN
SAFETY AND THAT NUT HAS NOT BOTTOMED-OUT AFTER TORQUING.

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SUBJECT TO AMENDMENT

WITHOUT NOTICE

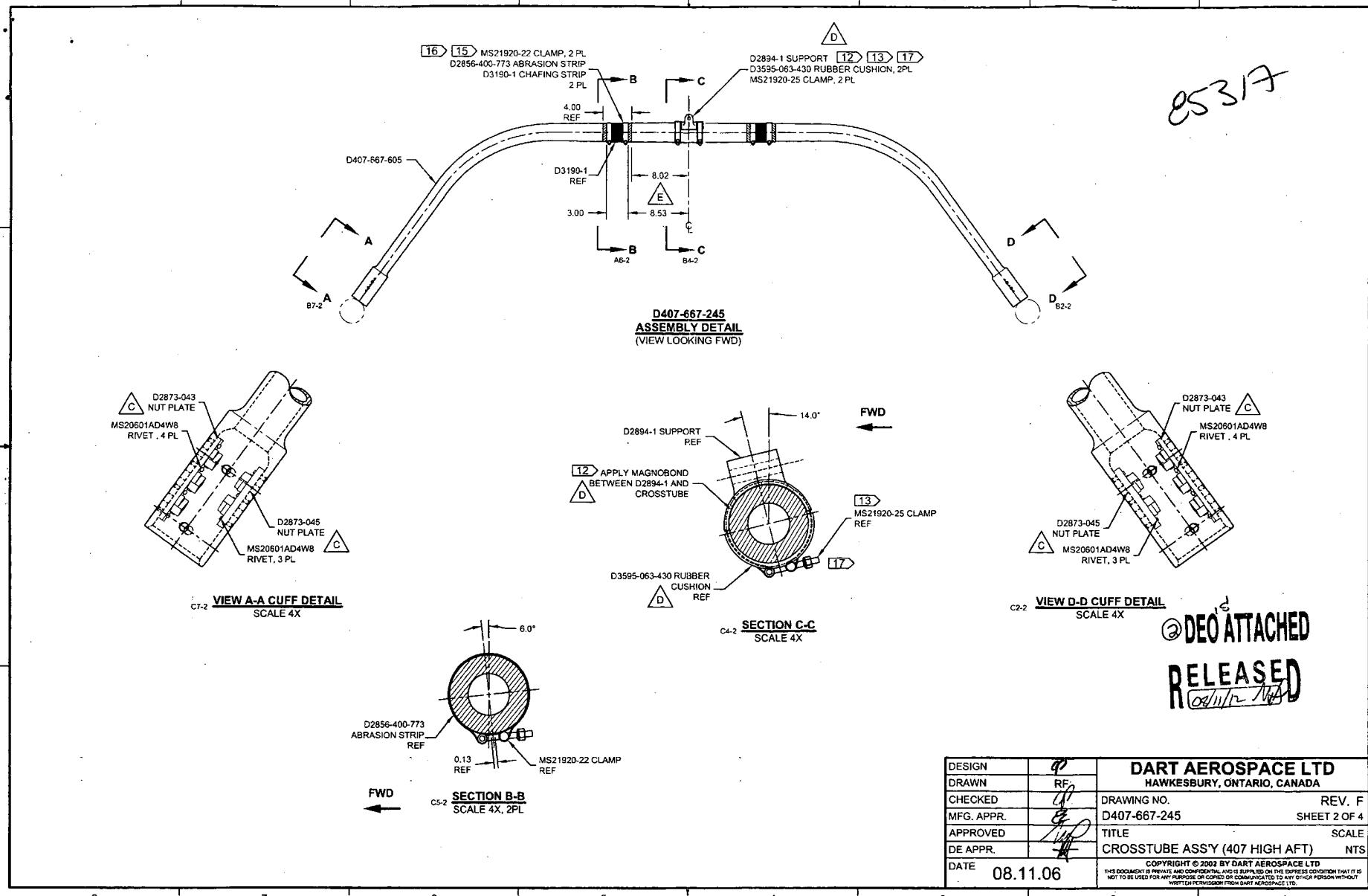
WORK ORDER

NO. 05317 MLJ
12/06/05

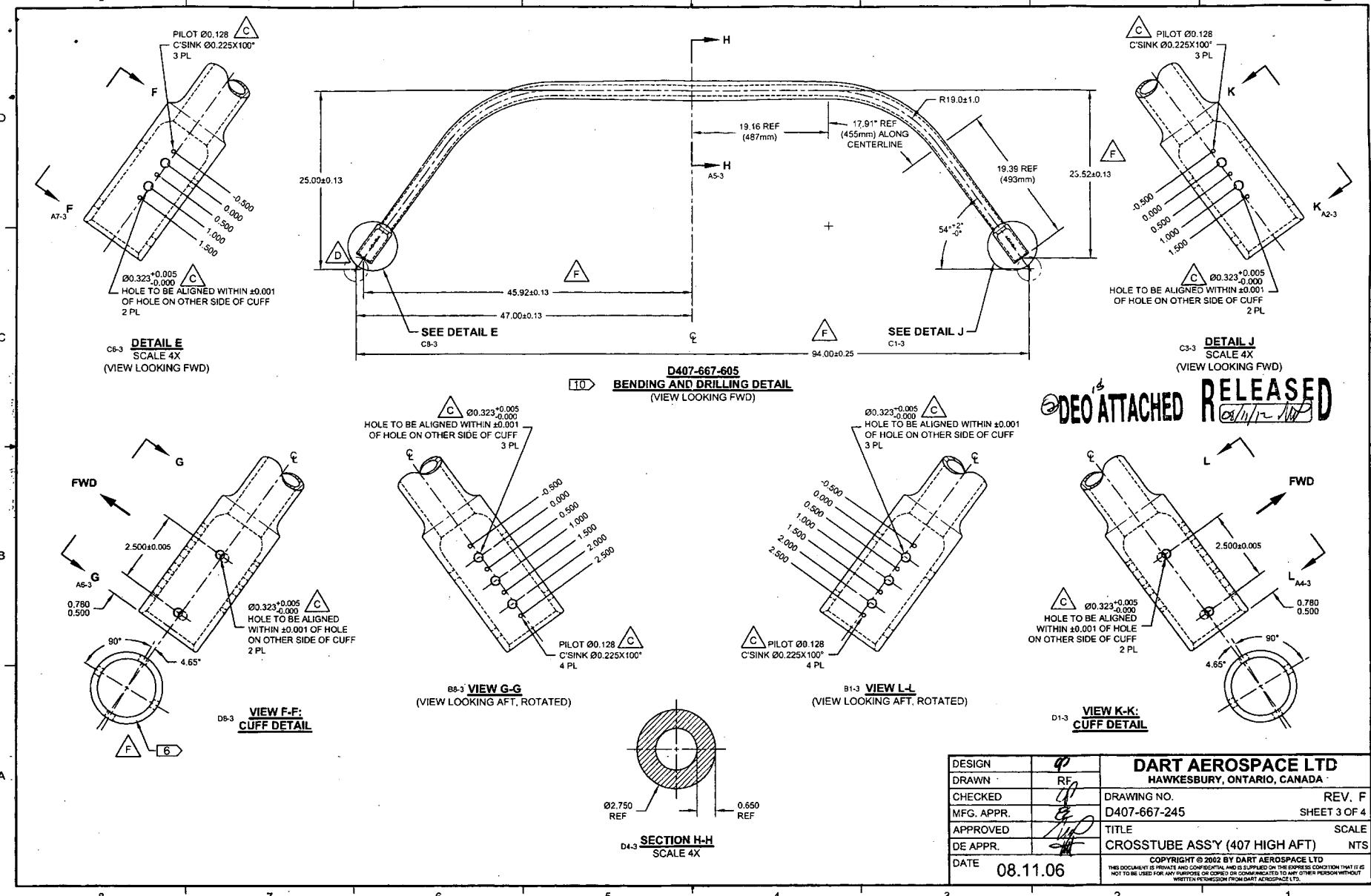
@DEO ATTACHED

RELEASED
08/11/06

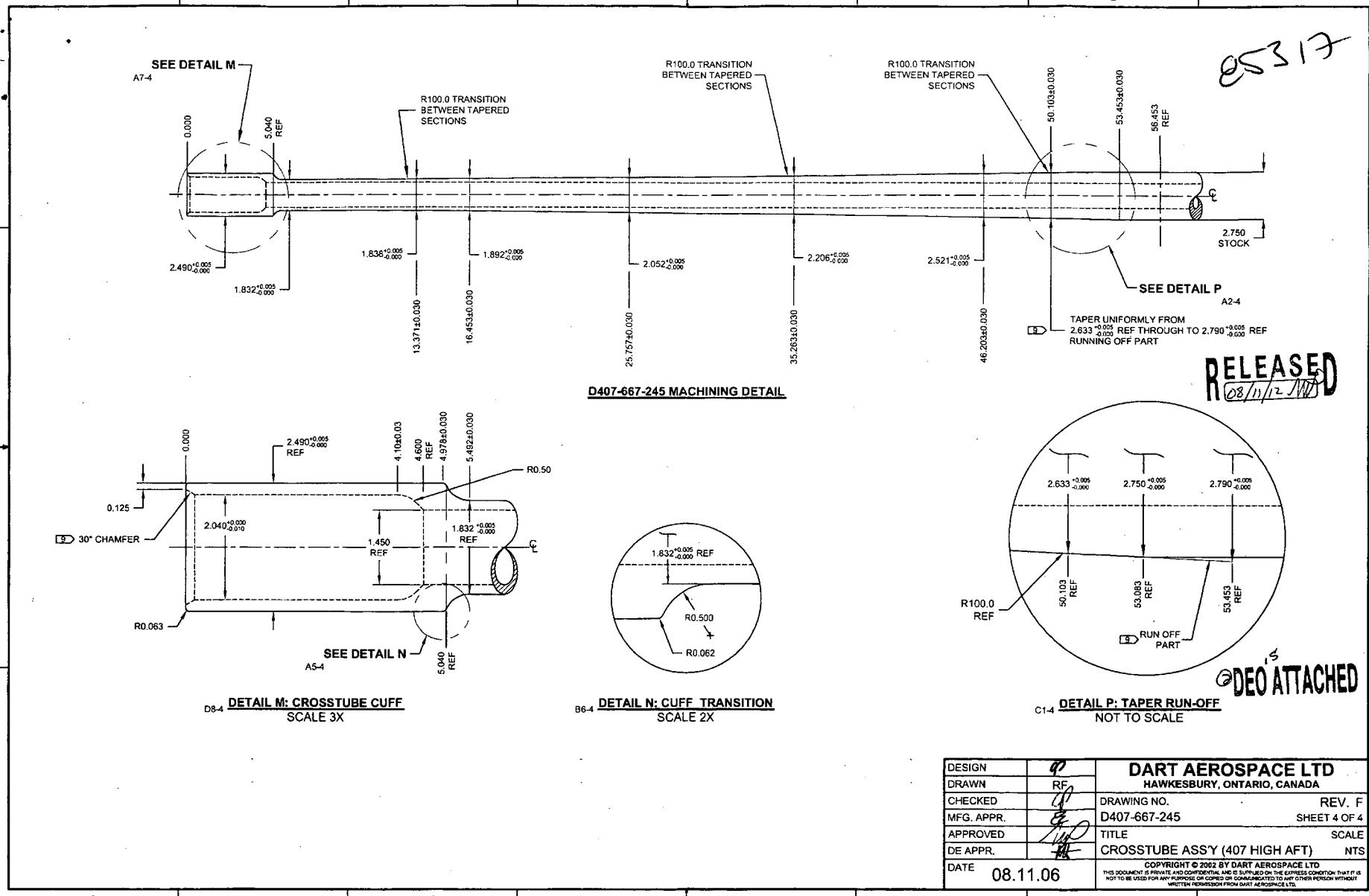
F	REFORMAT NOTES TO NEW STANDARDS (ZN B8-1); RELOCATED FLAG # 6 (ZN A8-3) PER NCR 210; REMOVED REF. & ADD TOLERANCES (ZN C6-3, C4-3 & D2-3)	RF	08.11.06
E	8.02 AND 8.53 WERE 8.40 AND 8.80 (ZN D5-2); REORGANIZED VIEWS AND REFORMATTED DRAWING TO CURRENT STANDARDS. REASONS: CLAMPS MOVED 0.375 TOWARD CL TO ELIMINATE INTERFERENCE WITH AIRCRAFT MOUNTS. REFERENCE: PAR#08-21 AND ECN#1225	MB	08.07.24
D	ADD VIEW FOR OEM SKID HOLES, ROTATE ORIENTATION OF CLAMPS SECTION F-F, REMOVE -851 ABRASION STRIP, ADD MAGNOBOND 6398, ADD CUSHION	PH	07.02.07
C	ADD HOLES AND NUT PLATES FOR COMPATIBILITY WITH BHT/AA SKIDTUBES	PH	05.07.26
B	ADD CHAFING SHIELD	CP	03.05.21
A	NEW ISSUE	CP	02.05.13
REV.	DESCRIPTION	BY	DATE
DESIGN	90	DART AEROSPACE LTD	
DRAWN	RF	HAWKESBURY, ONTARIO, CANADA	
CHECKED	UJ	DRAWING NO.	REV. F
MFG. APPR.	E	D407-667-245	SHEET 1 OF 4
APPROVED	JL	TITLE	SCALE
DE APPR.	TH	CROSSTUBE ASS'Y (407 HIGH AFT)	NTS
DATE	08.11.06	COPYRIGHT © 2002 BY DART AEROSPACE LTD THIS DOCUMENT IS THE PROPERTY OF DART AEROSPACE LTD. IT IS NOT TO BE USED FOR ANY PURPOSE OR COPIED OR COMMUNICATED TO ANY OTHER PERSON WITHOUT WRITTEN PERMISSION FROM DART AEROSPACE LTD.	



85317



DESIGN	<i>Q</i>	DART AEROSPACE LTD		
DRAWN	RF	HAWKESBURY, ONTARIO, CANADA		
CHECKED	<i>Q</i>	DRAWING NO.	REV. F	
MFG. APPR.	<i>Q</i>	D407-667-245	SHEET 3 OF 4	
APPROVED	<i>LJ</i>	TITLE	SCALE	
DE APPR.	<i>MM</i>	CROSSTUBE ASSY (407 HIGH AFT) NTS		
DATE	08.11.06	COPYRIGHT © 2008 BY DART AEROSPACE LTD THIS DOCUMENT IS THE PROPERTY OF DART AEROSPACE LTD. IT IS NOT TO BE USED FOR ANY PURPOSE OR COPIED OR COMMUNICATED TO ANY OTHER PERSON WITHOUT THE EXPRESS WRITTEN CONSENT OF DART AEROSPACE LTD.		



DESIGN	<i>RF</i>	DART AEROSPACE LTD
DRAWN	<i>RF</i>	HAWKESBURY, ONTARIO, CANADA
CHECKED	<i>RF</i>	DRAWING NO.
MFG. APPR.	<i>RF</i>	D407-667-245
APPROVED	<i>RF</i>	REV. F
DE APPR.	<i>RF</i>	SHEET 4 OF 4
DATE	08.11.06	TITLE
		CROSSTUBE ASS'Y (407 HIGH AFT) NTS

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85317

DRAWING NO. D407-667-245	TITLE CROSSTUBE ASSY (407 HIGH AFT)	REV. F	DART AEROSPACE LTD ENGINEERING ORDER	D.E.O. NO. D407-667-245-F-1	SHEET NO. SHEET 1 OF 2	SCALE NTS
DRAWN <i>B</i>	CHECKED <i>RP</i>	MFG. APPR. <i>E</i>	APPROVED <i>RP</i>	DE APPR. <i>RP</i>		
DATE 11.04.08	DATE 11.04.12	DATE 11.04.12	DATE 11.04.12	DATE 11.04.12	DATE 11.04.12	

PURPOSE:
REMOVED ABRASION STRIP IN FAVOR OF A THIN LAYER OF PROSEAL 890.

CHANGE:

PARTS LIST IS AMENDED AS FOLLOWS:

IS:

Item	Qty	Part Number	Description
3	0	D2856-400-773	ABRASION STRIP

WAS:

3	2	D2856-400-773	ABRASION STRIP
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NOTES 2 AND 15, SHEET 1 ARE AMENDED AS FOLLOWS:

IS:

- 2) FINISH: CHEMICAL CONVERSION COAT PER DART QSI 005 4.1
PRIME INSIDE AND OUTSIDE PER DART QSI 005 4.2
MASK UNDERSIDE OF CROSSTUBE AS SHOWN (HATCHED AREA) AND
PAINT OUTSIDE PER DART QSI 005 4.2
REMOVE MASKING AND APPLY CLEAR COAT
- 15) APPLY A THIN COAT OF PROSEAL 890 ON INSIDE CONCAVE SURFACE OF D3190-1
CHAFING SHIELDS AND LET CURE PER MANUFACTURER'S INSTRUCTIONS. INSTALL
PROSEALED D3190-1 CHAFING SHIELDS ONTO CROSSTUBE BY APPLYING A THIN COAT
OF PROSEAL 890 ONTO CROSSTUBE. BE SURE TO ELIMINATE ANY AIR GAPS.

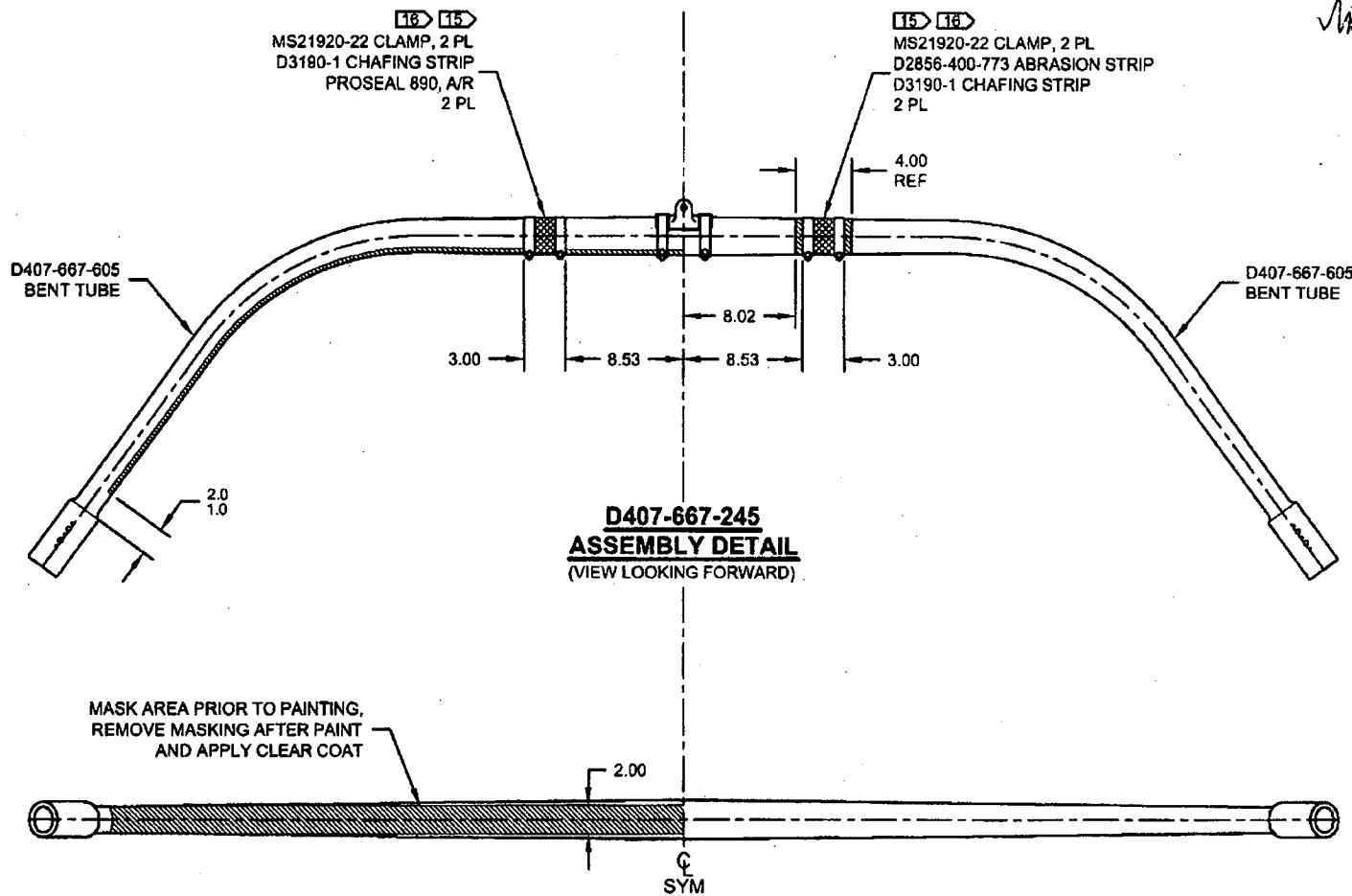
WAS:

- 2) FINISH: CHEMICAL CONVERSION COAT PER DART QSI 005 4.1
PRIME INSIDE AND OUTSIDE PER DART QSI 005 4.2
PAINT OUTSIDE PER DART QSI 005 4.2
- 15) INSTALL D2856-400-773 ABRASION STRIP WITH A 0.13 REF GAP ON BOTTOM SIDE OF
CROSSTUBE PER QSI 035.

RELEASED
2011-04-18
RP

85317

DRAWING NO. D407-667-245	TITLE CROSSTUBE ASSY (407 HIGH AFT)	REV. F	DART AEROSPACE LTD ENGINEERING ORDER	D.E.O. NO. D407-667-245-F-1	SHEET NO. SHEET 2 OF 2	SCALE NTS
DRAWN DATE 11.04.08	CHECKED DATE 11.04.11	MFG. APPR. PZ	APPROVED MH	DE APPR. H	DATE 11/04/12	DATE 11.04.12

RELEASED
2011-04-18
WVIS:WAS:

ES317

DRAWING NO. D407-667-245	TITLE CROSSTUBE ASS'Y (407 HIGH AFT)	REV. F	DART AEROSPACE LTD ENGINEERING ORDER	D.E.O. NO. D407-667-245-F-2	SHEET NO. SHEET 1 OF 1	SCALE NTS
DRAWN <i>qP</i>	CHECKED <i>ASS</i>	MFG. APPR. <i>IS</i>	APPROVED <i>MP</i>	DE APPR. <i>MP</i>		
DATE 11.09.07	DATE 11.09.10	DATE 11.09.10	DATE 11.09.10	DATE 11.09.10	DATE 11.09.10	

PURPOSE:

REPLACE MAGNOBOND WITH 3M DP460 SCOTCH-WELD EPOXY ADHESIVE

CHANGE:

IS:

Item	Qty -245	Part Number	Description
12	A/R	SCOTCH-WELD DP460	EPOXY ADHESIVE, 3M SCOTCH-WELD

WAS:

12	A/R	MAGNOBOND 6398	ROCKWELL SPECIFICATION RBO-120-023 ADHESIVE (TEXTRON/BELL SPEC. 299-947-100, TYPE II, CLASS 2 ADHESIVE)
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NOTE 12 & 17, SHEET 1 IS AMENDED AS FOLLOWS:

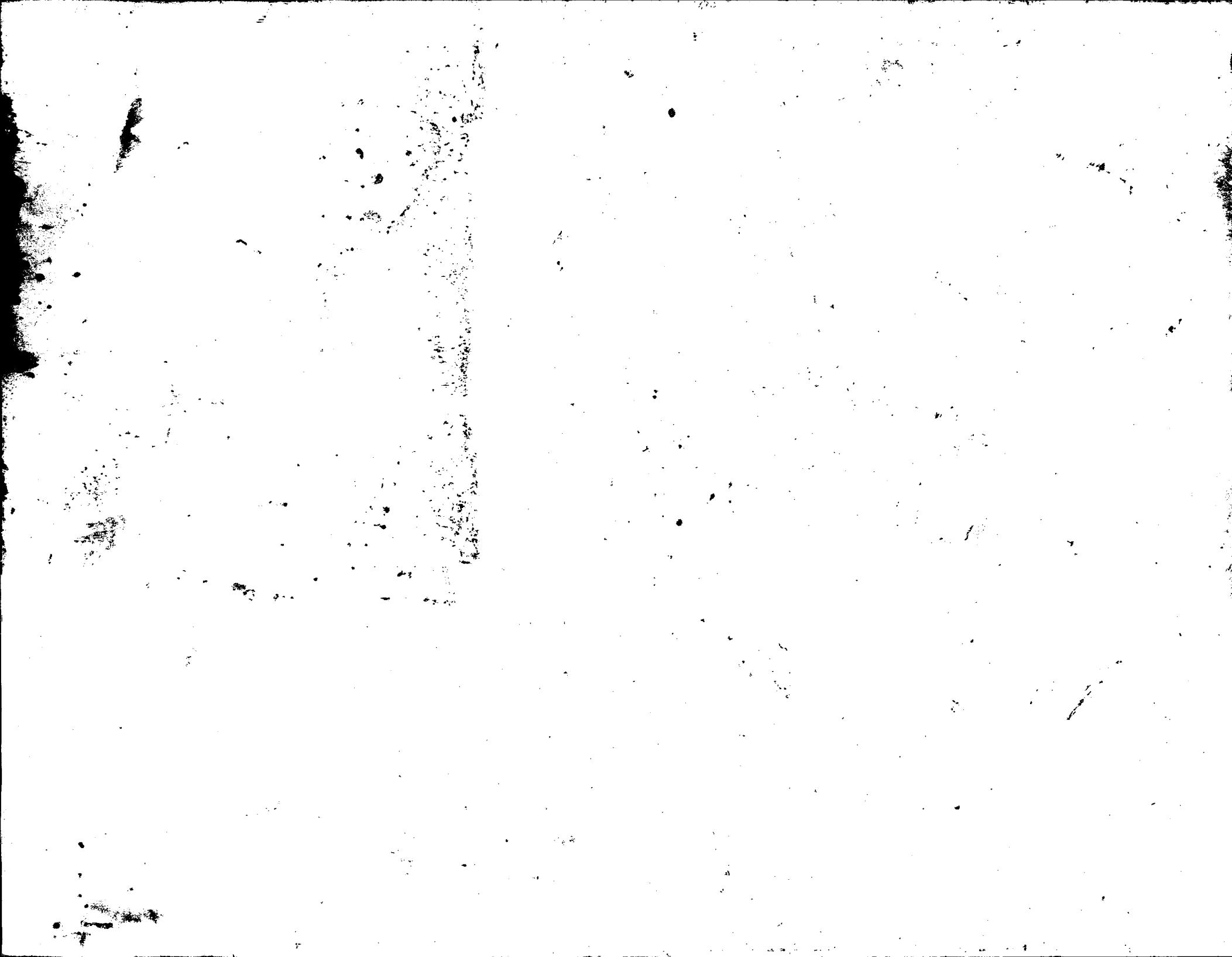
IS:

- 12) INSTALL D2894-1 CENTER SUPPORT USING A 0.04" TO 0.07" THICK LAYER OF SCOTCH-WELD DP460 PER QSI 015. LET CURE FOR 24 HOURS AFTER INSTALLATION AND PRIOR TO PACKAGING.
- 15) TORQUE CLAMPS 80 TO 100 IN-LB. ENSURE AT LEAST 1.5 THREADS SHOWING IN SAFETY AND THAT NUT HAS NOT BOTTOMED-OUT AFTER TORQUING. PRIOR TO PACKAGING, RE-CHECK TORQUE ON CLAMPS AFTER ADHESIVE HAS CURED FOR 24 HOURS.

WAS:

- 12) INSTALL D2894-1 CENTER SUPPORT USING A 0.03" TO 0.06" THICK LAYER OF MAGNOBOND 6398 PER QSI 015. LET CURE FOR 12 HOURS AFTER INSTALLATION AND PRIOR TO PACKAGING.
- 15) TORQUE CLAMPS 80 TO 100 IN-LB. ENSURE AT LEAST 1.5 THREADS ARE SHOWING IN SAFETY AND THAT NUT HAS NOT BOTTOMED-OUT AFTER TORQUING.

RELEASED
MP 2011-09-29





LIQUID PENETRANT TEST REPORT

P- 12202

CLIENT	<u>DAT Am Space</u>	DATE	<u>July 14 2012</u>	TIME	<u>AM</u>	OF	<u>1</u>
ATTENTION	<u>ANDY / LINDA</u>	ACUREN JOB NO.	<u>188-12-C0285</u>				
ADDRESS	<u>1270 ABERDEEN ST.</u>	PO/WO NO.	<u>17504 -</u>				
PROJECT	<u>F.P. II on cross tubes</u>	WORK LOCATION	<u>SANE</u>				
ITEM(S) EXAMINED	<u>- 11 - PCs</u>	ACCEPTANCE STD.	<u>ASTM 1417/08I</u>				
			REV./DATE <u>2005</u>				

JOB DESCRIPTION PROCEDURE NO. LTC02 REV./DATE 2008 TECHNIQUE NO. LT-~~1417~~ REV./DATE 2008

PART NO. SEE REEL LTS MATERIAL Aluminum - THICKNESS VARIOUS
 SCOPE A WET FLUORESCENT LIQUID PENETRANT EXAMINATION
WAS COMPLETED ON THE EXTERNAL SURFACE 100%

TEST DETAILS

METHOD	<input type="checkbox"/> FLUORESCENT	<input type="checkbox"/> VISIBLE	<input checked="" type="checkbox"/> WATER WASH	<input type="checkbox"/> SOLVENT REMOVABLE	<input type="checkbox"/> POST EMULSIFIED
FAMILY BRAND	<u>NATNAFLUX</u>		BLACK LIGHT S/N <u>16459</u>	<input type="checkbox"/> OUTPUT > 1000 μ W/cm ²	<input type="checkbox"/> AMBIENT < 2 fc
PENETRANT	<u>2L67</u>	MINIMUM Dwell TIME <u>45 10</u> MIN.	LIGHTING EQUIP. <input type="checkbox"/> FLASHLIGHT <input type="checkbox"/> TROUBLELIGHT <input type="checkbox"/> OUTPUT > 100 fc @ SURFACE		
PENETRANT REMOVER	<u>H2O</u>	MINIMUM DRY TIME <u>>10</u> MIN.	OTHER <u>LABINO</u>		
DEVELOPER	<u>SKD 52</u>	MINIMUM Dwell TIME <u>10</u> MIN.	LIGHT METER S/N <u>1098866</u>	CAL DUE DATE <u>July 19, 2012</u>	
DEVELOPER TYPE	<input type="checkbox"/> NON AQUEOUS	<input type="checkbox"/> AQUEOUS	<input type="checkbox"/> DRY		

TEST SURFACE

SURFACE CONDITION	<input type="checkbox"/> AS GROUND	<input type="checkbox"/> AS WELDED	<input checked="" type="checkbox"/> MACHINED	<input type="checkbox"/> SHOT BLASTED	<input checked="" type="checkbox"/> CLEAN BARE METAL
SURFACE TEMPERATURE	<input type="checkbox"/> < -4°C/ 20°F	<input type="checkbox"/> - 4°C/ 20°F TO 10°C/50°F	<input checked="" type="checkbox"/> 10°C/50°F TO 52°C/125°F		

RESULTS- METRIC IMPERIAL

<u>CROSS BEV. C.</u>	
"	<u>85877</u>
"	<u>86693</u>
"	<u>86692</u>
"	<u>84764</u>
"	<u>86932</u>
"	<u>87329</u>
"	<u>87328</u>
"	<u>85315</u>
"	<u>85316</u>
"	<u>85317</u>
"	<u>85318</u>

Engineering Request - NCL
WAS ORIGINALLY NOT ON THE 12/2012
Report P-10157.

12/07/2012

Scope of Services

The agreement of Acuren Group Inc. to perform services extends only to those services provided for in writing. Under no circumstances shall such services extend beyond the performance of the requested services. It is expressly understood that all descriptions, comments and expressions of opinion reflect the opinions or observations of Acuren Group Inc. based on information and assumptions supplied by the owner/operator and are not intended nor can they be construed as representations or warranties. Acuren Group Inc. is not assuming any responsibilities of the owner/operator and the owner/operator retains complete responsibility for the engineering, manufacture, repair and use decisions as a result of the data or other information provided by Acuren Group Inc. In no event shall Acuren Group Inc.'s liability in respect of the services referred to herein exceed the amount paid for such services.

Standard of Care

In performing the services provided, Acuren Group Inc. uses the degree, care and skill ordinarily exercised under similar circumstances by others performing such services in the same or similar locality. No other warranty, expressed or implied, is made or intended by Acuren Group Inc.

SIGNATURES

CLIENT REPRESENTATIVE	<u>Andy Sheldon</u>	PRINT	<u>Andy Sheldon</u>	SIGNATURE	DTR #	<u>E117389</u>
TECHNICIAN (SIGNATURE):	<u>Z.M.K.E. Sheldon</u>				REPORT REVIEWED BY:	
NAME (PRINT):	<u>Z.M.K.E. Sheldon</u>	1 ST TECHNICIAN	<u>CGSB LEVEL</u>	SNT LEVEL	2 ND TECHNICIAN	
			<u>CGSB REG. NO.</u>	<u>6606</u>	CGSB LEVEL	SNT LEVEL
					CGSB REG. NO.	
					NAME	INITIALS

WHITE - CLIENT COPY

CANARY - OFFICE COPY

PINK - TECHNICIAN COPY

GOLD - OFFICE COPY

Change Record

Part Number D407-667-205
Description 407 AFT CROSS TUBE

Page 1 of 1